REMARKS

The Amendments

Claims

Claims 1-31 are in allowance after entry of the previous amendments. No claims are either canceled or withdrawn. No new matter has been added.

Applicants thank Examiner for entering the previous amendments and for allowing claims 1-31.

Specification

The specification has been amended as described in the previous section. First, on page 2 of the specification, the two paragraphs in the section entitled, 'Summary of the Invention', the contents of original claim 14 are inserted into the second paragraph. Original claim 14 was present in the application as originally filed, thus providing support for this amendment.

On page 10, line 1 and 10 of the specification, "Zn" has been added as an example of a first material. Support for the amendment can be found in original claim 13 which was present in the application as originally filed.

On page 11, between the first two full paragraphs, two paragraphs have been added teaching an embodiment of the invention. The first inserted paragraph teaches an embodiment describing the first material as being selected from the group consisting of Pt, Zn, Co, Fe, Ti, Cd, Hg, Mg, Ga, In, Al, Ni, Sn and Bi; and the second material as being selected from the group consisting of S, Se, O, P, N, F, Cl, I, Br, As and Sb. Support for this amendment can be found in original claim 13 which was present in the application as originally filed.

The second inserted paragraph teaches another embodiment of the invention wherein the second material as being selected from the group consisting of S, O, Se, Te, P, N, As, Cl, I, Br and Bi. Support for the amendment can be found in original claim 23 which was also present in the application as originally filed.

As each of these amendments was found in the original claims as filed, no new matter is believed to be added to the specification by these amendments.

The Response

Objection under 37 CFR 1.75(d)(1)

In the Office Action mailed January 21, 2010, Examiner has objected to the specification for allegedly failing to provide proper antecedent basis for the claimed subject matter. However, Applicants would respectfully submit that 37 CFR 1.75(d)(1) only requires "terms and phrases" to have clear antecedent basis in the specification so that "the meaning of the terms in the claims may be ascertainable by reference to the description" (emphasis added). Applicants respectfully disagree with Examiner's interpretation of 37 CFR 1.75(d)(1) and MPEP § 608.01(o), that each term in the claims must have explicit antecedent basis in the specification. Furthermore, MPEP § 608.01(o), third paragraph, states that the "applicant is not limited to the nomenclature used in the application as filed[.]" According to MPEP 2163.02, "The subject matter of the claim need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement." Thus, the need to provide verbatim support for each and every term in the claims would be unnecessary.

However, since the claims are all allowed and solely in the interest of efficient prosecution of the patent application, Applicants address each of Examiner's objections and have provided amendments to the specification as deemed appropriate to overcome the objections .

In paragraph 2(a) of the Office Action, Examiner has objected to Zn as recited in claim 5 for allegedly not being exemplified in the specification. However, Applicants respectfully direct Examiner's attention to page 11 of the specification, middle paragraph beginning, "As non-limiting examples, nanoreactors in accordance with the present invention have shells that may comprise ZnS, ZnSe, ZnTe, ZnO," where the specification provides non-limiting examples of nanoshell compounds that include Zn. The examples listed in the paragraph, ZnS, ZnSe, ZnTe, and ZnO, are claimed in allowed claim 5. Also, Zn can be found listed as part of the compound CdZn on page 10, line 13 of the specification. Thus, there is antecedent basis in the specification for Zn.

To be clear, Applicants have amended page 10, lines 1 and 10 of the specification to include Zn in the list of the transition metals. This amendment finds specific support in the original claim 13. Thus, Applicants request that the objection be

withdrawn as there is antecedent basis in the specification for Zn.

In paragraph 2(b) of the Office Action, Examiner has objected to the "first material and second material for the nanoshell as listed in claims 13 and 22-24, especially, Cl, I, Br and Bi as the second material," for allegedly not having antecedent basis in the specification (Office Action, page 2).

For the first material listed in claims 13 and 22, Applicants respectfully direct Examiner's attention to the specification at pages 10-12, beginning at the last paragraph on page 10 where the specification teaches what materials can be used as the preliminary main material and further lists non-limiting examples of elements that can be used as the first material for the nanoshell. The paragraph in the specification lists all of the same elements that claims 13 and 22 recite for the first material of the nanoreactor. Thus there is antecedent basis for these first materials as claimed in claims 13 and 22.

For the second material listed in claims 13, 23, and 24, Applicants respectfully direct Examiner's attention to page 11 of the specification, middle paragraph beginning, "As non-limiting examples, nanoreactors in accordance with the present invention have shells that may comprise …," where almost all the elements listed for the second material in claims 13, 23, and 24 can be found in non-limiting examples of binary or ternary nanoshell compounds. For example, claim 13 lists "S" for sulfur as an element that can be used as the second material. Correspondingly, page 11, line 2, of the specification lists sulfur as part of the binary compound CdS.

Moreover, Applicants respectfully point out that the specification never limits the second material to only those listed specifically by name. The specification teaches that the second "material be capable of donating [an] element or compound of interest" (page 11, lines 3-4). One of ordinary skill in the art would know how to obtain a compound capable of donating Cl, I, Br, or Bi, etc. in a chemical reaction with a first material listed in the claims. In any case, synthesis of other nanocrystalline structures using Cl, I, Br, and Bi have been described and are well-known in the art. Also, Cl is listed in the specification on page 11, line 13, as part of the binary compound $NiCl_2$.

Solely in the interest of furthering prosecution and achieving Applicants' patent goals, Applicants have amended the specification and inserted the contents of claims 13 and 23 into the specification. Support for the amendments can be found in original

claims 13 and 23. Therefore, specific antecedent basis for the claims is found in the specification and Applicants request that this objection be withdrawn.

In paragraph 2(c) of the Office Action, Examiner objected to the diffusion rate difference between the first and second material as recited in claim 14 for allegedly not having antecedent basis in the specification. However, Applicants respectfully direct Examiner's attention to the paragraph at bottom of page 1 of the specification which states,

> It is known that porosity may result from differential solid-state diffusion rates of the reactants in an alloying or oxidation reaction. Previous studies on the interdiffusion of 30-micrometer powders with layered composition showed significant porosity, but the geometry and distribution of the pores were not uniform, probably due to aggregation and still bulk-like dimension of the particles. Recently, significant progress has been made in synthesizing colloidal nanocrystals with well-controlled size, shape and surface properties. This invention discloses the production of a uniform population of nanoreactors by employing such high-quality nanocrystals as the starting materials. (Specification, pages 1 and 2).

Furthermore, throughout the examples, the specification describes the use of reactants having different diffusion rates in an alloying or oxidation reaction to create nanometer scale pores in solids for use as nanoreactors (e.g., page 9, page 12, Example 1 at pages 20-21) . Additionally, on page 11, lines 18-21 of the amended specification, the specification states,

> In accordance with the present invention, the mobilities of the reacting species, the first material i.e. the preliminary main material and the second material are not necessarily chosen such that they are drastically different to result in vacancy transport.

The specification thus notes that the difference in the diffusion rates between the first and second materials need not be very large in order to achieve the creation of nanoreactors. While Applicants argue that the specification has proper antecedent basis for claim 14, to further prosecution and solely to achieve Applicants' patent goals, the specification was amended to include the contents of claim 14 in the specification at page 2 in the Summary of the Invention. No new matter is believed to be introduced as claim 14 was originally filed in the application. Thus, Applicants request that the objection be withdrawn as there is antecedent basis in the amended specification.

Based on the amendments to the specification, the non-limiting examples of

binary and ternary compounds that can be used for the nanoshell, and the description of the well-known use of different reactant diffusion rates to create nanoreactors, Applicants believe that the objections are traversed and request that the objections to the specification be withdrawn and the case issued as the claims are all allowed.

CONCLUSION

For the reasons stated above, Applicants believe that the specification provides proper antecedent basis for the claimed subject matter and therefore respectfully request that the Examiner withdraw the objection. If in the opinion of the Examiner, a telephonic conference would expedite the prosecution of the subject application, Applicants encourage the Examiner to call the undersigned at (510) 495-2456.

A fee of $245.00 is required for a two-month extension of time. The Commissioner is authorized to charge any necessary and additional fees, including fees for additional extensions of time, that may be due to Deposit Account No. 120690, referencing Attorney Docket: IB-2018.

Respectfully submitted,

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